

Figure 1A

Nucleotide sequence of inserted environmental DNA in clone ELIP
(SEQ ID NO:1)

TCTATGAGCA	ACAAGGCGGT	TTTAGCGAAG	CGCAGGCCGA	TGAGTTGTG	50	
GCCGAGGC	GCG	TGGAAACATT	CCGCTGGCAC	CAGCACGCAA	CGGTTGACGC	100
CGAAACCTAC	CGCGCGTTC	ATGATGAGCA	CCGGCTGATC	GCCGATGTAG	150	
TCTGCTCCG	TGGCTGCCAC	ATTAACCACC	TGACCCCGCG	CACGCTCGAT	200	
ATCGACCGCG	TGCAGTCGCT	GATGCCGGAA	CGCGGAATTA	CCCCAAAAGC	250	
CATTATCGAA	GGGCCGCCGC	GCCGCGAGCG	CCCGATTAA	CTGCCGCCAGA	300	
CCAGCTTAA	AGCGCTGGAA	GAGCCTATT	TGTTCGCCGG	TGAGCATCAC	350	
GGAACGCATA	CCGCCCCTT	CGGCGAAATA	GAACAGCGCG	GCGTAGCGCT	400	
GACGCCGAAA	GGCCGGGGCGC	TGTACGACGA	ACTGCTGCTG	GCGGCCGGCA	450	
ACGGCACCGA	TAATCTCAGC	CACCAGCAGC	ATTACACGA	AGTGTTCACC	500	
GTTTCCCGGA	CAGCGACCGG	CTGCTGCGCC	GCCAGGGGCT	GGCCTATTTC	550	
CGCTATCGTT	TGACGCCCGT	TGGCGAAATG	CACCGCCACT	CAATCAAGCC	600	
AGGCAGCAC	CCGCAGCTGC	TTATAGAACG	CGGCTGGCTG	GTGGCGCAGC	650	
CGGTTATTAA	TGAAGATTTC	CTCCCGGTCA	GCGCGGCCGG	TATTTTCCAG	700	
TCAAACCTTG	GCAGCGACGG	CGGGCAACGG	CAGCACGCC	ATTCCAGCCG	750	
CAGCGAGTTT	GAACAGGCC	TTGGCGCAGA	GGTTGCAGAC	GAGTTCGCCC	800	
TCTATCAGCA	GGCCGAGGAT	CGCAGTAAAC	GCCGTTGCGG	TTGCTGTAA	850	
ACGCGCTACC	CTGCTGGAGT	GTCAGTAACA	AGGAACAGCA	GATGGAACAA	900	
GTTGTTAGCC	GTTGCTCAGG	GGAGACTGAG	CGGCGTTCTT	CAGGGGAAAG	950	
TTGCGGTCTA	TCGCGGCATC	CCCTTGCGG	CTCCGCCGGT	GGGTGAAC	1000	
CGCTGGCGGG	CACCTCGTCC	CCCGCGCAC	TGGCAGGGTA	TCCGCCAGGC	1050	
GGATACATT	GCGCCTGCAT	GCTGGCAAAG	CCTCGAATAC	TGCAAAGCGG	1100	
TTGGCGCGG	CGATCCCGGC	CAGTTTCTG	AAGATTGCCT	GTATCTCAAT	1150	
ATCTGGACCC	CGGCCCGGGC	GGATGCGGAG	CGGCTGCCGG	TTATGGCTG	1200	
GCTGCACGGT	GGGGGCTACA	CTATCGGC	AGGCTCGCTG	CCGCCCTACG	1250	
ATGGAGCAGC	CTTCGCCTCG	CGGGATGTAG	TCCTGGTGAC	GGTGAATTAC	1300	
CGTCTGGCC	ATCTCGGCTT	TTTCGCCAT	CCGGCGCTGG	ATGAAGAAAA	1350	
TCCAGACGGC	CCGGTTCAT	ATTTCGCGCT	TTTAGACCAA	ATTGCTGCC	1400	
TGAAATGGGT	GCAGGAAAT	ATCGCTGTT	TCGGCGCGA	CGCGGGGAAT	1450	
GTCACGCTGT	TTGGCGAGTC	TGCCGGGGCG	CGTAGCGTGC	TTTCGCTGCT	1500	
GGCGTCGCCG	CTGGCGAAA	ACCTTTCCA	CAAAGGTATT	ATACAAAGCG	1550	
CCTACACGTT	GGCGGATGTC	GACAGGAAGA	AAGCCCTGAA	ACGTGGCGTA	1600	
GCGCTGGCCG	GTCATTACGG	GCTGCAAAT	GCCACAGCGG	ATGAAC	1650	
CGCTCTGCCT	GGCGATGGGC	TGTGGCGCT	TGAAGGGCCG	CTTAACATTG	1700	
GTCCAACGCC	AAATCTCCGGC	GACGTGCGTC	TGCCTGAGCC	GATGCTGGAT	1750	
ATATTCTCG	CCGGCGTCA	GCACCGCATG	CCCTTGATGG	TCGGGAGCAA	1800	
CAGCGACGAG	GCAAGCGTGC	TGAGCTACTT	CGGCATCGAT	CCTGCCGGGC	1850	
AGGTGCAACT	GCTGCGCCGG	GGAGCGGGGT	TTCCGGACTG	GGGGCTTATC	1900	
AAACTGCTGT	ATTCCGGAG	TGAAANGGGG	ATGCCCGAAC	TCGGCGACAA	1950	
GGTGTGCCGC	GATATGGCTT	TTNCCNCGCT	GGGTTTTGTT	GTGATGCAAG	2000	
CCCAGCAGCG	GGTCAATCAG	CCCTGCTGGC	GCTACTATT	TGATTATGTG	2050	
GGGGAGGGCGG	AACGTTAAAT	CTATGCCAAC	GGCACCTGGC	ACGGCAACGA	2100	
AGTGCCGTAT	GT	TTTGACAA	CGTTAAGTCT	GACGCCACCC	2150	
ACGTCAACCA	AAACGATCTC	ACGTTGCCG	GGCAAATTG	TGACTACTGG	2200	
ACCCGTTTG	CCCGCAGCGC	CGGTCCCCAC	AGTAAAGCGA	TACCGGGCCC	2250	
GCTAAGCTGG	CCTGCCTGCG	TTCCGGCAA	GGACCGAACG	ATGCGGTTAG	2300	
GCGTTCACTC	GGGGCGCGGG	TTCAAAGTGG	AAAACCGCTT	TATGCGCATG	2350	
AGAATGCAGC	TGTTTAAGCG	GGTCATGAAG	CATCACGTCA	GCCTTGACTG	2400	

Figure 1B**Nucleotide sequence of inserted environmental DNA in clone ELIP
(SEQ ID NO:1)**

AGCAACTCAT	GGCAAAATGC	TTCAAGCCCG	CGGGCGTGCT	CGCTGCCGGG	2450
TTTAACCGCC	AGACGGTAGC	CCGCACCGGT	TTTACACTG	CGATCAAACG	2500
GCCTGACCAG	CCGCCCGGTA	CGAATATCTT	CTGCCACCAG	CGTTTCATCG	2550
CGCATGGCGA	TCCCAAACCC	CTGAATAGCG	GCGCTGATGG	CGAGATCCAT	2600
AGTGTAAAAA	TGCTGATTT	TACTCATTGC	CTGCCAGGGC	GCAAGAAAAC	2650
CCGGTTCTGC	CAGAAGTGAC	CAGTCGGTGC	GGTCCCGCGT	TGGGTGCAAA	2700
AATGTCAGTC	TTTCCCAGCC	GCTATCTCT	TTTGGCAGCA	GGCTCTGGCT	2750
TACAACCAGG	GTCAGCGCCT	CCTCGAACAA	CAGCGTGCCG	GTTCAGGCCG	2800
ACTGCCAAA	AACAATTGCC	GCGTCAAACG	GCTCATTTTT	GAAGTCACG	2850
CCGTGCTCAA	CGGTCTGGT	CAGCGAACCC	TGTAGCTCCG	GCATCGTTG	2900
TTCAAGCTGA	ATCAGCTTG	GCACCCAGCCA	GCGCATCGCG	CAGGTTGGCG	2950
CTTTAAGACG	AATAATTCT	GGCTTGTGGC	AGGCGCGGTC	GGCTACGTCC	3000
AGCAGATTAT	TGAACCGCCT	TTGTAATTCC	GGGAGCAGGG	CGCTGCCCTG	3050
TGGCGTAAGG	CGCAGCCCCG	GGCGTGGCG	TTCAAAAAGC	GCAAAGCCAA	3100
GCCACTGTT	GAGGGCGGCA	ATTTTGCGGC	TGACGGCGCC	CTGGGTGAGG	3150
CAAAGTTCT	TCGCGGCCCT	GGTCAGGTT	AGGTGCCTGG	CGGGTGACGA	3200
GAAAAGCGTC	CAGAGTATT	AGGGGAAAT	TGCGCCCGT	CATGATGCTC	3250
TCCGTTGAGC	TATGCATT	TTGCATGGCT	ATTATGACAA	CAATTGATT	3300
GTCGTGGCAA	TCGCATCCGG	ATTGAATAGT	TATGCAAATC	GCATATTGTT	3350
CAGGAGCGGC	TATGGCCATG	CAAACCCCGG	TGCAACATCG	TTCAAAACTG	3400
CCGGATGTAG	GAACCACCAT	ATTACGGTT	ATCGGTCA	TTTCCGCCCA	3450
ACATAAGGCG	ATCAACCTT	CTCAGGGCGC	GCCCAACTTC	CCCTGTGACC	3500
CGCAGCTTAT	TGCCGGAGTC	ACCAGGGCAA	TGCAAGGAGGG	GCATAACCAG	3550
TATGCGTCCA	TGACCGGACT	TGCGTCGCTG	AAAAATCTA	TTGCTGAAA	3600
AGTCGCGGCG	CTTACGGCT	CAACCTACGA	TCCGGCGGAT	GAAGTGCTGG	3650
TTACCGCCAG	CGCCAGCGAA	GGGCTGTATT	CCGCTATCGG	CGGACTGGTA	3700
CACCCGGCG	ACGAAGTTAT	CTATTCGAA	CCCTCTTTG	ACAGCTACGC	3750
GCCGATTGTT	CGGCTCCAGG	GCGAACGCC	GGTTGCCCTT	AAGCTCAGCC	3800
TGCCTGACTT	CACCATTAAC	TGGGATGAAG	TGCGCGCTGC	CATAACGCCG	3850
CGTACCCGCA	TGATTATTGT	CAACACGCCG	CATAACCCAA	CGGGCAGGT	3900
GTTCAGCGCT	CATGATCTCG	AAATGCTGGC	GGCGCTTACC	CGTAATACGG	3950
ATATCGTTGT	CCTGTCTGAC	GAAGTGTACG	AGCACATCGT	GTTTGACGGA	4000
CAAAAGCATC	ACGGCATGGC	CACGCACCCG	CAGCTTGCCG	AGCGTAGCGT	4050
TATCGTTCA	TCGTTTGCA	AAACCTTCCA	TGTTACCGGC	TGGCGCGTGG	4100
GGTACTGCCT	GGCGCCCGCC	GGCGTGATGG	ATGAGATTG	CAAGGTGCAT	4150
CAGTTCTGA	TGTTTCAGC	CGATACGCCA	ATGCAGCAGC	CTTTGCTGA	4200
TTACATGAGC	GATCCGAAA	CTTATCTCTC	GCTGGCGAGC	CTTTACCAGC	4250
GCAAGCGTGA	TTTAATGCAG	TCTCTGCTGG	CGGAGTCGCC	ATTGAGCTG	4300
CTGCCGAGCG	CCG				4313

Figure 2**Nucleotide sequence of ORF for esterase/lipase in ELIP clone
(SEQ ID NO:2)**

ATGGTCTGGC	TGCACGGTGG	GGGCTACACT	ATCGGCGCAG	GCTCGCTGCC	50
GCCCTACGAT	GGAGCAGCCT	TCGCCTCGCG	GGATGTAGTC	CTGGTGACGG	100
TGAATTACCG	TCTTGGCCAT	CTCGGCTTT	TCGCCCCATCC	GGCGCTGGAT	150
GAAGAAAATC	CAGACGGCCC	GGTCATAAT	TTCGCGCTTT	TAGACCAAAT	200
TGCTGCCCTG	AAATGGGTGC	AGGAAAATAT	CGCTGCTTTC	GGCGGGCGACG	250
CGGGGAATGT	CACGCTGTTT	GGCGAGTCTG	CCGGGGCGCG	TAGCGTGCTT	300
TCGCTGCTGG	CGTCGCCGCT	GGCGAAAAAC	CTTTCCACA	AAGGTATTAT	350
ACAAAGCGCC	TACACGTTGC	CGGATGTCGA	CAGGAAGAAA	GCCCTGAAAC	400
GTGGCGTAGC	GCTGGCCGGT	CATTACGGGC	TGCAAAATGC	CACAGCGGAT	450
GAACTCCGCG	CTCTGCCTGC	GGATGGGCTG	TGGGCGCTTG	AAGGGCCGCT	500
TAACATTGGT	CCAACGCCAA	TCTCCGGCGA	CGTCGTGCTG	CCTGAGCCGA	550
TGCTGGATAT	ATTCTTCGCC	GGGCGTCAGC	ACCGCATGCC	CTTGATGGTC	600
GGGAGCAACA	GCGACGAGGC	AAGCGTGCTG	AGCTACTTCG	GCATCGATCC	650
TGCCGGGCAG	GTCGAACCTGC	TGCCGCCGGGG	AGCGGCCGTTT	CCGGACTGGG	700
GGCTTATCAA	ACTGCTGTAT	TCCC GGAGTG	AAANGGGGAT	GCCC GAACTC	750
GGGCGACAGG	TGTGCCGCGA	TATGGCTTT	NCCNCGCTGG	GT TTTGTTGT	800
GATGCAGGCC	CAGCAGCGGG	TCAATCAGCC	CTGCTGGCGC	TACTATTTG	850
ATTATGTGGG	GGAGGCAGAA	CGTAAAATCT	ATGCCAACGG	CACCTGGCAC	900
GGCAACGAAG	TGCGTGTATGT	TTTGACACG	TTAAGTCTGA	CGCCACCCGC	950
AAGTGAATAC	GTCAACCAAA	ACGATCTCAC	GT T T G C C G G G	CAAATTGTG	1000
ACTACTGGAC	CCGTTTGCC	CGCAGCGCCG	GTCCCCACAG	TAAAGCGATA	1050
CCGGGCCCGC	TAAGCTGGCC	TGCCTGCGTT	CGCGGCAAGG	ACCGAACGAT	1100
GC GGTTAGGC	GTTCACTCGC	GGGC GCGGTT	CAAAGTGGAA	AACC GCTTTA	1150
TGCGCATGAG	AATGCAGCTG	TTTAAGCGGG	TCATGAAGCA	TCACGTCAGC	1200
CTTGACTGA					1209

Figure 3**Translated amino acid sequence of the putative esterase/lipase from the ELIP clone
(SEQ ID NO:3)**

MVWLHGGGYT	IGAGSLPPYD	GAAFASRDVV	LTVNYRLGH	LGFFAHPALD	50
EENPDGPVHN	FALLDQIAAL	KWVQENIAAF	GGDAGNVTLF	GESAGARSVL	100
SLLASPLAKN	LFHKGIIQSA	YTLPDVDRKK	ALKRGVALAG	HYGLQNATAD	150
ELRALPADGL	WALEGPLNIG	PTPISGDVVL	PEPMLDIFFA	GRQHRMPLMV	200
GSNSDEASVL	SYFGIDPAGQ	VELLRRGAAF	PDWGLIKLLY	SRSEXGMPEL	250
GRQVCRDMAF	XXLGFVVMQA	QQRVNQPCWR	YYFDYVGEAE	RKIYANGTWH	300
GNEVPYVFDT	LSLTPPASEY	VNQNDLTFAG	QICDYWTRFA	RSAGPHSKAI	350
PGPLSWPACV	RGKDRTMRLG	VHSRARFKVE	NRFMRMRMQL	FKRVMKHHVS	400
LD*					402

Figure 4**Details of the putative ORF's encoding esterase/lipase activity**

Clone	ORF		Length	Translated protein
	Start position	End position		
ELIP	1193	2401	1209 bp	402 amino acids
				
			ELIP 4313	
LIP1	1143	1934	792 bp	263 amino acids
				
			LIP1 2285	
LIP2	2675	2031	645 bp	214 amino acids
				
			LIP2 3112	